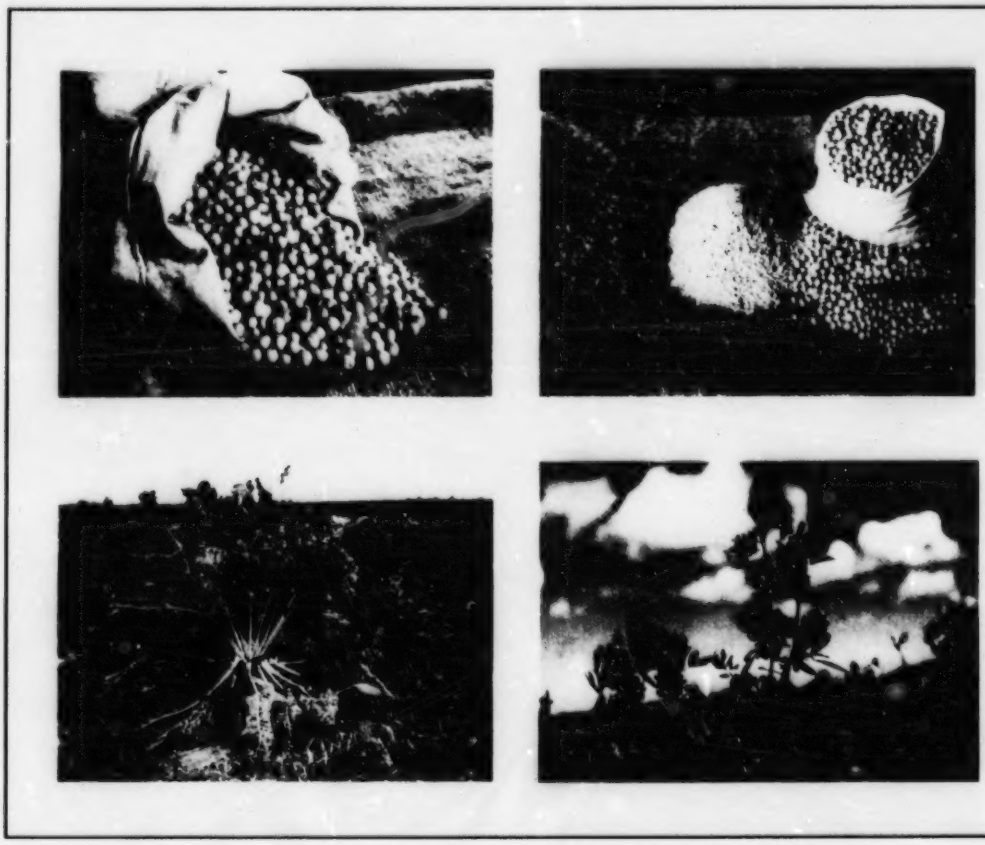
Alberta 2001
Specialty Crop Report



Alberta

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Acknowledgments

We gratefully acknowledge the participation of producers of specialty crops across the province. Without their cooperation, this report would not have been possible. In addition, the cooperation of Alberta Agriculture, Food and Rural Development staff, including Chuanliang Su, Reynold Jaipaul, Nabi Chaudhary, Charlie Pearson, Dr. Stan Blade, Shukun Guan, Guangzhi Liu, Melodie Mynzak and Brenda Kerychuk is very much appreciated.

For additional information relating to the various sections of this report, please do not hesitate to contact the subject area specialist referenced under each section.

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Alberta 2000 Specialty Crop Survey

Purpose of Survey:

By Reynold Jaipaul

To address some of the data and information needs of the Specialty Crop industry in Alberta, the Statistics and Data Development (SADD) Unit has been conducting an annual Specialty Crop Survey. Now into its eighteenth year, the survey attempts to capture data on area (seeded and harvested acres), yield and production, for the various types of specialty crops grown.

Data gathered from the survey are used primarily to generate related provincial and sub-provincial estimates by the SADD Unit. In turn, these estimates are used to validate some of the Alberta estimates generated by Statistics Canada, as well as to provide industry and other stakeholders with benchmark statistics for some of the "new" and emerging crops grown in the province.

Methodology

The Specialty Crop Survey which is provincial in scope, collects data through a non-probability sampling procedure. In December 2000, survey questionnaires were mailed out to 4,640 specialty crop producers across Alberta. The questionnaires specifically asked survey participants to provide, at their earliest convenience, information on the type of specialty crop grown, area (seeded and harvested acres), yield and production for the year 2000. Survey participants were also made aware that participating in the survey was voluntary. Moreover, all individual responses would be kept confidential under the provisions of the Federal Statistics Act, as well as under the Provincial Freedom of Information and Protection of Privacy (FOIP) Act, by which the SADD Unit is governed and operates. As of April 6, 2001, a total of 1,225 questionnaires were returned. Of this total, 1,169 were usable and formed part of the basis in the generation of the Alberta 2000 specialty crop estimates.

Survey responses received were reviewed for data completeness, validated and entered into an electronic database. The data was then subjected to some computerized analyses, the results of which were rolled up into group summaries, to preserve data confidentiality of individual survey respondents. In turn, the group summaries, in conjunction with consultations with industry, published sources (e.g.

Statistics Canada) and Alberta Agriculture, Food and Rural Development (AAFRD) subject area/provincial specialists were used to generate the provincial and sub-provincial (Census Division) estimates, where appropriate.

It cannot be over emphasized that extensive consultation is done with AAFRD's subject area/provincial specialists and industry, in the derivation of the provincial/sub-provincial estimates, especially in instances where specialty crop production tended to be localized/regionalized. For example, mustard and lentils are grown mainly in the Southern Region and Eastern areas of the Central Region. Largely due to proximity and familiarity with local conditions, provincial specialists in district/regional offices tend to offer useful information and valuable insights on crop conditions and yields, particularly when attempting to firm up some of the sub-provincial estimates generated from the survey. Likewise, administrative data showing yield and crop area grown under private contracts also tend to add value to some of the estimates.

It should be noted that the derived estimates are subject to error. Some of the possible causes of error include data coding, entry editing and tabulation. Nonetheless, we believe that the statistics published in this report are reliable estimates for Alberta.

Survey Results

By Chuanliang Su

Area, Yield and Production in Alberta

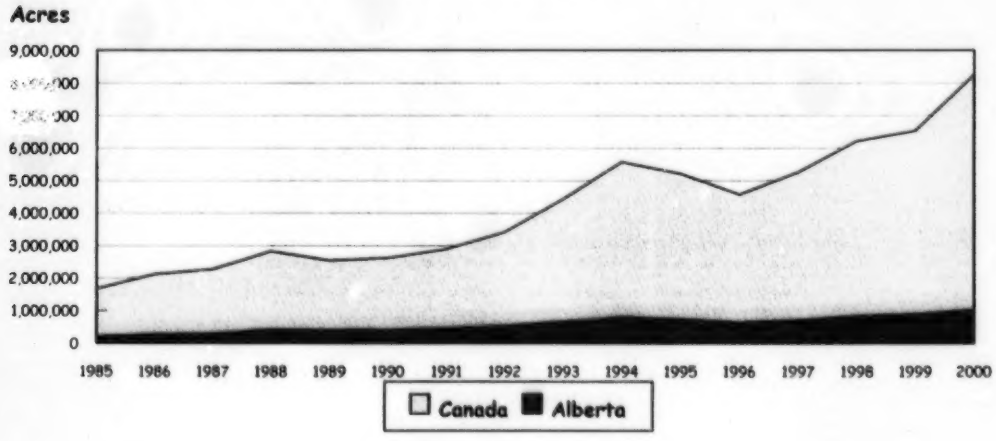
Specialty crop acreage continued to increase in 2000, as seen in Figure 1. Total harvested specialty crop acreage in Alberta, excluding forage seed crops and potatoes, reached a record one million acres, representing an increase of 31% from 764,000 acres in 1999. The low commodity prices for major grains/oilseeds, the need for diversification/crop rotation and a good cash return from some specialty crops were just a few reasons behind the upward trend of specialty crop acreage in recent years.

The dry conditions experienced in 2000 in the Southern Region and Eastern areas of the Central Region had reduced the yield of many specialty crops grown in these areas. In 2000, mustard and lentils, grown primarily in these two areas, had significantly reduced yields as compared to 1999. Other specialty crops in the area, such as dry field peas and chickpeas, also suffered a substantial yield loss due to the dryness. However, crops grown under irrigation had benefited from the heat in the area in the 2000 crop season. Alfalfa (for seed) had a record yield of 525 pounds per acre and dry beans had a near record yield of 2,250 pounds per acre. Most alfalfa (for seed) and dry bean acreage was irrigated in 2000.

About 5 to 10 percent of crops in the Peace Region could not be harvested in 2000 due to the wet conditions in the late fall. However, producers managed to harvest all dry field pea crops.

Figure 1 - Alberta and Canada Specialty Crop Area

Seeded Acreage, 1985 - 2000



Specialty Crops in Western Canada

The upward trend of specialty crop acreage can also be seen in other provinces in Western Canada. In 2000, a total of 7.28 million acres of specialty crops, excluding forage seed crops and potatoes, were harvested in Western Canada (see Figure 2). {Estimates for British Columbia, Saskatchewan and Manitoba are from Statistics Canada's November Estimate of Principal Field Crops, Canada, 2000; estimates for Alberta are from AAFRD, Alberta 2000 Specialty Crop Survey}.

Dry field peas remained the largest specialty crop in 2000. Production of total dry field peas in Western Canada was estimated at over 2.8 million tonnes from about 3.0 million harvested acres in 2000. Lentils was the second largest specialty crop. Total harvested acreage was estimated at 1.7 million acres with a total production of 0.92 million tonnes. The estimate of mustard seed production was 0.22 million tonnes from a total of 0.55 million harvested acres. Canary Seed harvested acreage was estimated at 0.4 million acres and production at 0.17 million tonnes.

Saskatchewan remained the largest producer of specialty crops in 2000. Saskatchewan harvested 5.4 million acres of specialty crops, including 2.22 million acres of dry field peas, 1.64 million acres of lentils, 650,000 acres of chickpeas, 455,000 acres of mustard seed, 355,000 acres of canary seed and 20,000 acres of sunflower seed.

In 2000, 145,000 acres of sunflower seed were harvested in Manitoba, accounting for 85% of total sunflower area in Western Canada. In addition, Manitoba harvested 230,000 acres of dry beans, 150,000 acres of dry field peas, 130,000 acres of grain corn, 40,000 acres of canary seed, 33,000 acres of lentils and 30,000 acres of buckwheat in 2000.

British Columbia had a total of 10,000 harvested acres of dry field peas and 22,000 harvested acres of fodder corn in 2000.

Figure 2 - Western Canadian Acreage of Specialty Crops

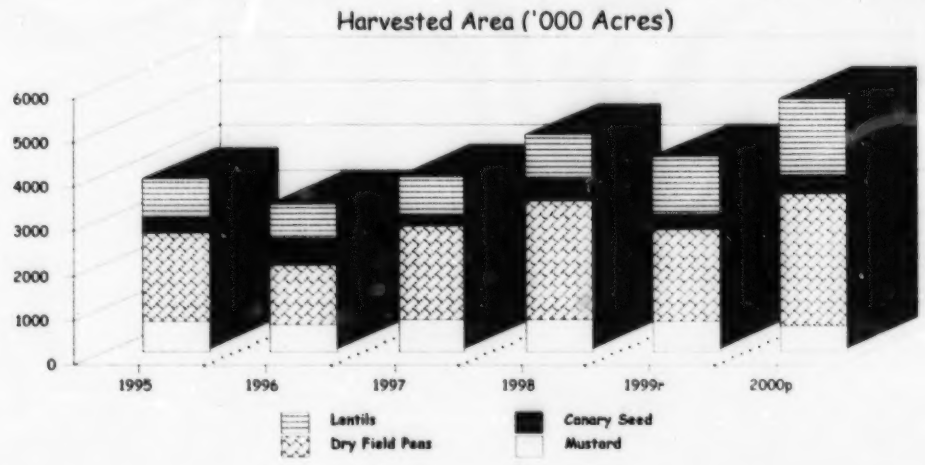
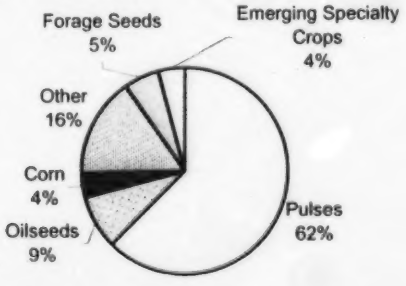


Table 1 - Alberta 2000 Specialty Crops

	Acreage (acres) Seeded	Acreage (acres) Harvested	Yield (Unit/Acre)	Production (Tonnes)
Pulses				
Green Peas	250,000	242,200	40.6 bu	267,617
Yellow Peas	390,000	380,400	32.4 bu	335,428
Dry Beans	55,000	54,500	22.5 cwt	55,622
Fababeans	2,000	2,000	2,520 lbs	2,286
Lentils	35,000	34,100	684 lbs	10,580
Oilseeds				
Brown Mustard	17,000	16,600	950 lbs	7,153
Yellow Mustard	48,000	43,700	575 lbs	11,398
Oriental Mustard	25,000	24,600	750 lbs	8,369
Sunflowers	6,500	6,400	2,050 lbs	5,951
Safflower	3,500	3,000	----	----
Corn				
Grain Corn	15,000	13,000	110.0 bu	36,324
Silage Corn	30,000	28,600	17.1 ton	443,672
Other				
Potatoes (1)	52,900	47,700	310.0 cwt	670,700
Triticale	75,000	55,400	1,994 lbs	50,098
Canary Seed	12,000	7,900	1,100 lbs	3,942
Sugar Beets (2)	42,400	42,000	21.9 tonne	920,252
Forage Seeds (3)				
Alfalfa Seed	17,117	17,117	525 lbs	4,076
Alsike Clover	1,855	1,855	185 lbs	156
Brome Grass	5,005	5,005	215 lbs	488
Red Fescue	13,142	13,142	250 lbs	1,490
Red Clover	2,015	2,015	210 lbs	192
Timothy	13,447	13,447	265 lbs	1,616
Other	10,729	----	----	----
Emerging Specialty Crops				
Chickpeas	50,000	49,000	738 lbs	16,403

Figure 3 - Alberta Specialty Crop Seeded Acreage, 2000



Source: AAFRD, Statistics and Data Development Unit, Alberta 2000 Specialty Crop Survey

except for:

(1) Statistics Canada, Canadian Potato Production by Province, November 2000

(2) Alberta Sugar Beet Growers' Marketing Board

(3) Canadian Seed Growers' Association - Inspected Acres of Grass and Legume Seed

Figure 4

Alberta Census Divisions
ID, MD and Counties

Alberta
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Statistics and Data Development Unit

eMapGIS 2000(c) 07/25/2000

Table 2 - 2000 Specialty Crops by Census Division

C.D.	Dry Field Peas	Mustard	Lentils	Beans	Chickpeas
			Harvested Area (acres)		
1	37,325	3,028	16,467	26,200	13,422
2	51,448	18,113	9,374	27,300	17,450
3	16,610	----	----	----	----
4	18,843	41,151	4,924	----	5,030
5	101,908	10,648	----	----	11,322
6	30,800	----	----	----	----
7	89,591	----	----	----	----
8	19,618	----	----	----	----
9	----	----	----	----	----
10	125,204	----	----	----	----
11	41,245	----	----	----	----
12	11,220	----	----	----	----
13	15,250	----	----	----	----
17	22,546	----	----	----	----
18	----	----	----	----	----
19	38,961	----	----	----	----
Alberta	**622,600**	**84,900**	**34,100**	**54,500**	**49,000**
			Yield Per Acre		
	(bushels)	**(pounds)**	**(pounds)**	**(cwt)**	**(pounds)**
1	13.8	600	648	23.8	690
2	15.5	575	690	21.3	570
3	14.7	----	----	----	----
4	17.5	850	750	----	1,230
5	32.5	610	----	----	660
6	48.4	----	----	----	----
7	39.6	----	----	----	----
8	43.1	----	----	----	----
9	----	----	----	----	----
10	44.4	----	----	----	----
11	43.7	----	----	----	----
12	50.4	----	----	----	----
13	50.4	----	----	----	----
17	39.8	----	----	----	----
18	----	----	----	----	----
19	36.0	----	----	----	----
Alberta	**35.6**	**699**	**684**	**22.5**	**738**
			Production (tonnes)		
1	14,018	824	4,840	28,237	4,201
2	21,703	4,724	2,934	26,376	4,512
3	6,645	----	----	----	----
4	8,974	15,866	1,675	----	2,806
5	90,137	2,946	----	----	3,389
6	40,570	----	----	----	----
7	96,554	----	----	----	----
8	23,012	----	----	----	----
9	----	----	----	----	----
10	151,291	----	----	----	----
11	49,053	----	----	----	----
12	15,390	----	----	----	----
13	20,917	----	----	----	----
17	24,421	----	----	----	----
18	----	----	----	----	----
19	38,172	----	----	----	----
Alberta	**603,045**	**26,920**	**10,580**	**55,622**	**16,403**

Totals may not add up due to rounding or insufficient data for generating estimates for some census divisions.
cwt - hundred weight (hundred pounds)

Table 3 - 1999 Specialty Crops by Census Division

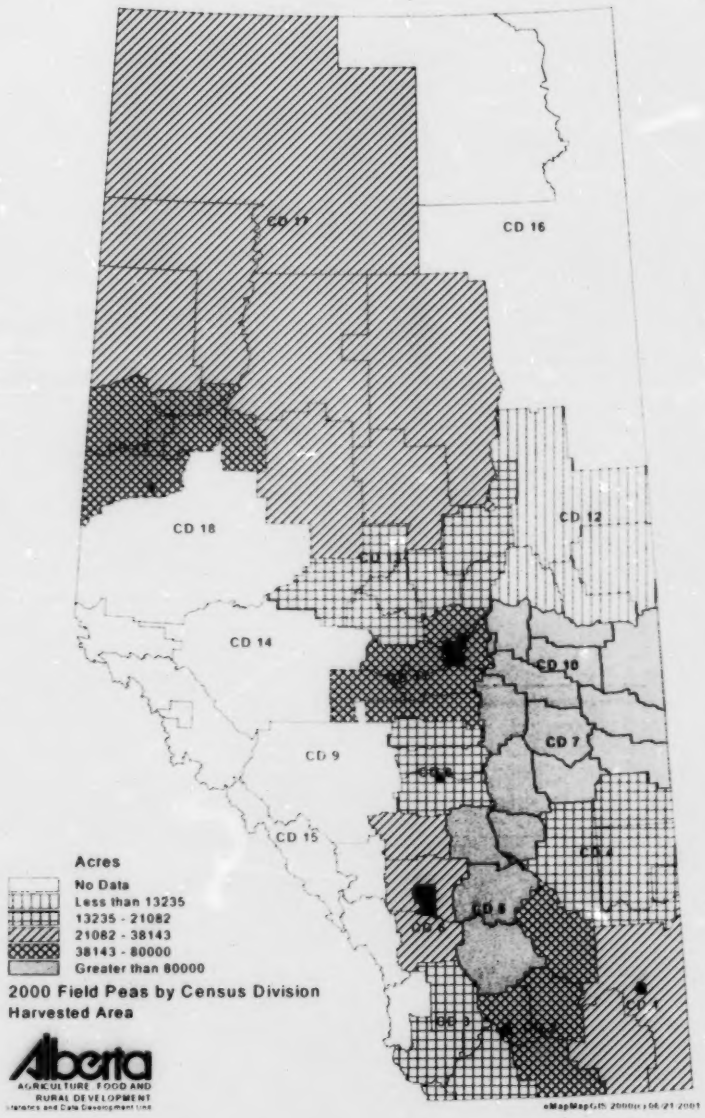
C.D.	Dry Field Peas	Mustard	Lentils	Beans
		Harvested Area (acres)		
1	26,500	11,500	7,450	23,500
2	37,650	26,700	9,250	23,100
3	5,350	6,200	----	----
4	8,900	28,800	4,100	400
5	70,200	14,600	100	----
6	18,950	----	----	----
7	75,950	2,200	600	----
8	14,450	----	----	----
9	----	----	----	----
10	100,950	----	300	----
11	20,700	----	200	----
12	10,450	----	----	----
13	17,250	----	----	----
17	16,800	----	----	----
18	3,250	----	----	----
19	27,650	----	----	----
Alberta	**455,000**	**90,000**	**22,000**	**47,000**
		Yield Per Acre		
	(bushels)	**(pounds)**	**(pounds)**	**(cwt)**
1	40.0	1,035	1,242	20.4
2	44.0	1,050	1,260	19.7
3	41.0	850	----	----
4	42.0	1,145	1,260	14.4
5	36.0	1,150	960	----
6	46.0	----	----	----
7	47.0	1,750	960	----
8	46.0	----	----	----
9	----	----	----	----
10	47.0	----	1,320	----
11	47.0	----	900	----
12	42.0	----	----	----
13	50.0	----	----	----
17	44.0	----	----	----
18	24.0	----	----	----
19	26.0	----	----	----
Alberta	**42.9**	**1,100**	**1,248**	**20.0**
		Production (tonnes)		
1	28,848	5,399	4,197	21,745
2	45,085	12,717	5,287	20,684
3	5,970	2,390	----	----
4	10,173	14,958	2,343	261
5	68,779	7,616	44	----
6	23,724	----	----	----
7	97,149	1,746	261	----
8	18,090	----	----	----
9	----	----	----	----
10	129,127	----	180	----
11	26,478	----	82	----
12	11,945	----	----	----
13	23,473	----	----	----
17	20,118	----	----	----
18	2,123	----	----	----
19	19,565	----	----	----
Alberta	**530,800**	**44,800**	**12,400**	**42,700**

Totals may not add up due to rounding or insufficient data for generating estimates for some census divisions.
cwt - hundred weight (hundred pounds)

Dry Field Peas

Even though dry field peas are grown across Alberta, acreage is more concentrated in Census Divisions 5 (Drumheller), 7 (Provost) and 10 (Vermilion). The three census divisions account for about 50% of total harvested area of dry field peas in Alberta.

In 2000, Alberta producers planted a record 640,000 acres and harvested 622,600 acres of dry field peas. The estimate of provincial average yield was 35.6 bushels per acre in 2000, compared to 42.9 bushels per acre in 1999. Total dry field pea production in Alberta was estimated at 603,045 tonnes in 2000, an increase of nearly 14% from 530,800 tonnes in 1999.



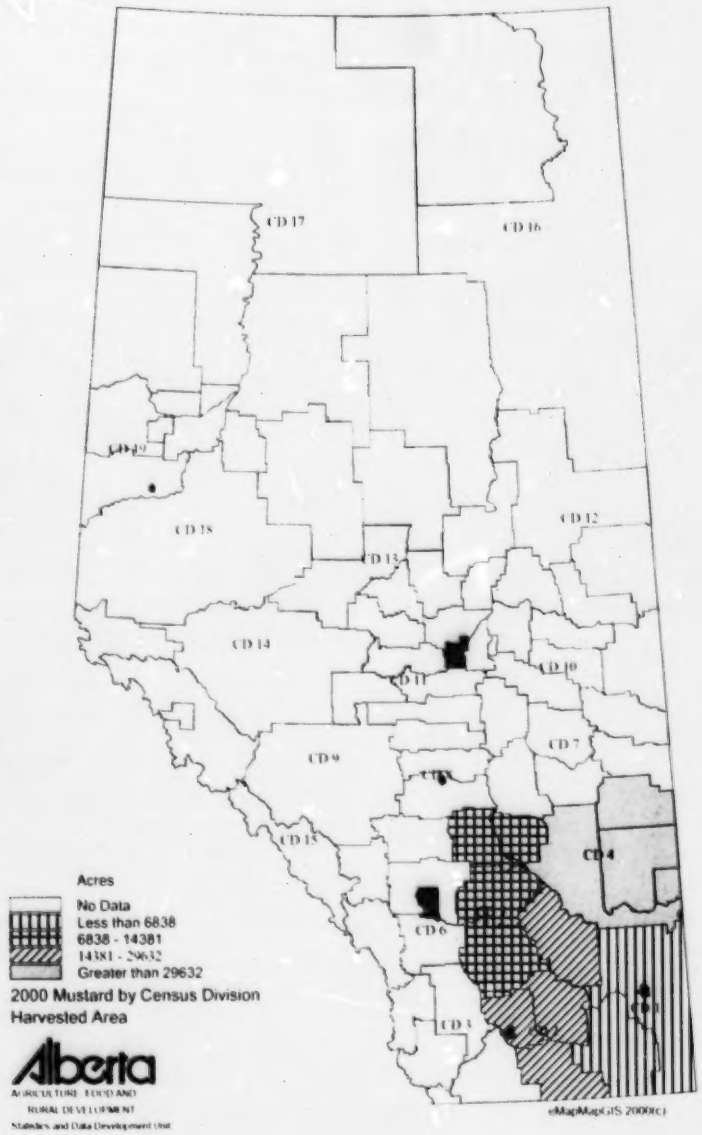
According to the annual irrigation report by AAFRD, Irrigation Branch, only 9,548 acres of dry field peas were irrigated in 2000. Most dry field peas were produced on dry land. The dry conditions experienced in 2000 in the Southern Region and the eastern areas of the Central Region had reduced dry field pea yield in those areas. However, dry field peas in the rest of the province had an average or near average yield.

Mustard

Alberta producers seeded 10% less acreage of mustard in 2000 than in 1999. Total seeded area was estimated at 90,000 acres, of which, 84,900 acres were harvested. Mustard was mainly grown on dry land in southern Alberta, with Census Divisions 2, 4 and 5 accounting for over 80% of total harvested area. Mustard suffered a substantial yield loss in 2000 caused by the dry conditions in the area. The average mustard yield was estimated at 699 pounds per acre, compared to 1,100 pounds per acre in 1999.

Total mustard production was estimated at 26,920 tonnes in 2000, with 11,398 tonnes for yellow mustard, 7,153 tonnes for brown mustard and 8,369 tonnes for oriental mustard. Total mustard production in 1999 was 44,800 tonnes.

Yellow mustard continued to be dominant in acreage. In 2000, a total of 43,700 acres of yellow mustard were harvested, compared to 24,600 acres for oriental mustard and 16,600 acres for brown mustard. Yellow mustard has lower yields but usually gets higher prices versus brown and oriental mustard.

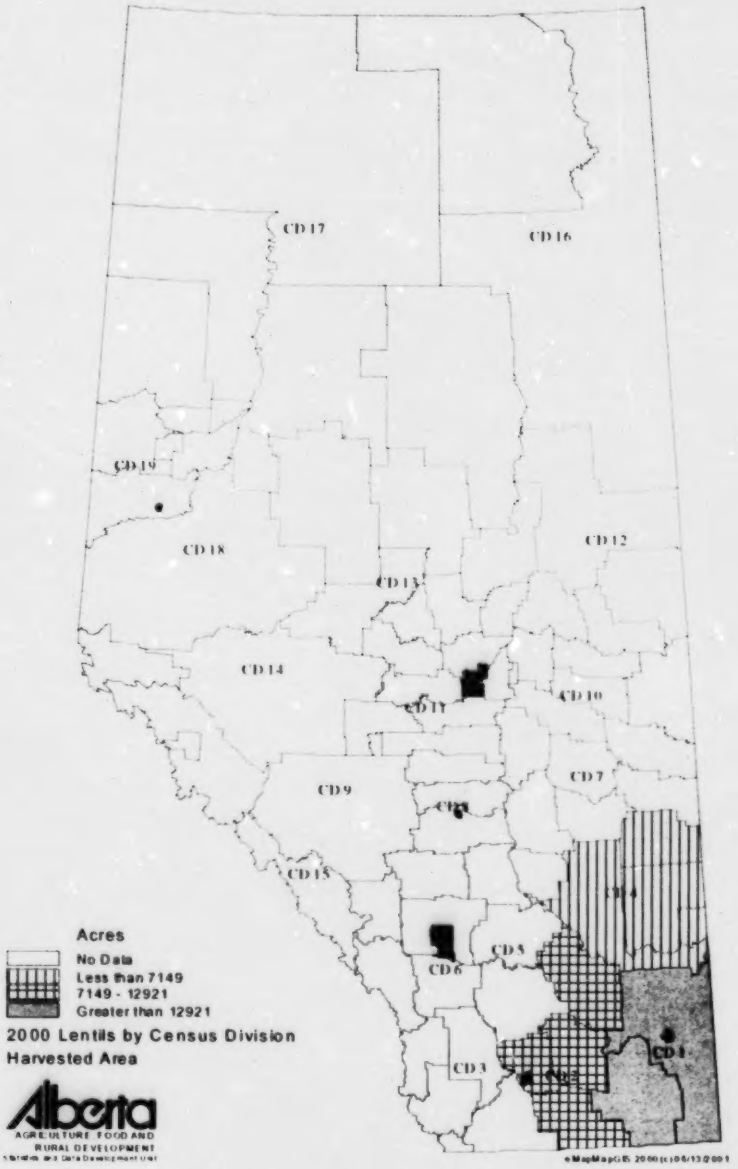


Lentils

Lentils are grown in the southeastern parts of the province (Census Divisions 1, 2 and 4). The dry conditions experienced in these areas, during the 2000 crop season, reduced lentil yield. The provincial average yield of 684 pounds per acre in 2000 was substantially lower than the 1999 provincial average yield of 1,248 pounds per acre.

Total harvested acreage of lentils in Alberta increased to 34,100 acres in 2000 from 22,000 acres in 1999. However, due to the yield loss, total lentil production in 2000 was only 10,580 tonnes, compared to 12,400 tonnes in 1999.

Lentils in Alberta are grown primarily on dry land. Only 283 acres of lentils were irrigated in 2000, according to the annual irrigation report from the Irrigation Branch of Alberta Agriculture, Food and Rural Development.



Dry Beans

The area seeded to dry beans in 2000 was 55,000 acres. According to the 1996 Census of Agriculture, dry beans were grown mainly in Forty Mile County No. 8 (in Census Division 1) and Taber M.D. No. 14 (in Census Division 2). About 54,500 acres were harvested in 2000, producing a near-record average yield of 2,250 pounds per acre. Over 50,200 acres of dry beans were irrigated in 2000.

Total dry bean production in 2000 was estimated at 55,622 tonnes, compared to 42,700 tonnes in 1999.

In Alberta, dry beans were grown under contracts with Agricore and two other companies in 2000.

Chickpeas

Many producers in Alberta started growing chickpeas in recent years. Total seeded acreage of chickpeas was estimated at 50,000 acres in 2000. There were no published estimates of Alberta chickpea acreage for previous years.

In 2000, Alberta producers harvested 49,000 acres of chickpeas. Chickpeas were grown in southern Alberta, with acreage concentrating in Census Divisions 1, 2, 4 and 5. With the dry conditions experienced in the area, chickpeas produced an average yield of 738 pounds per acre. Total chickpea production in 2000 was estimated at 16,403 tonnes.

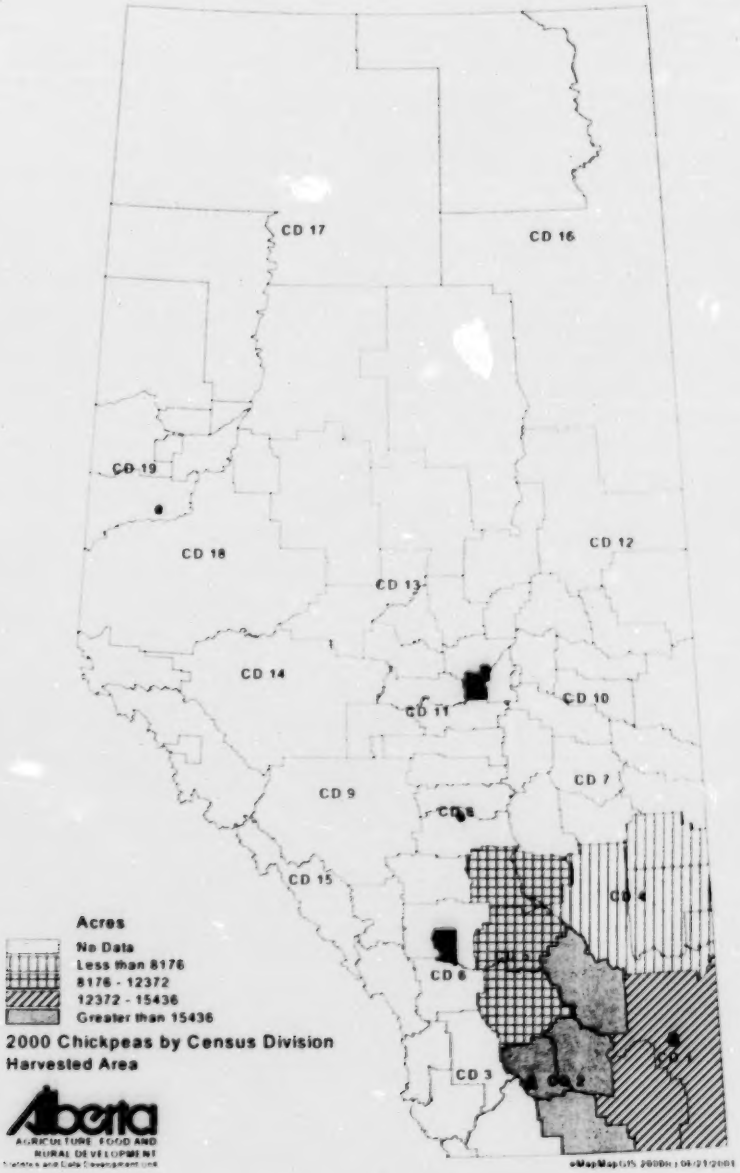


Table 4 - Alberta Specialty Crops Historical Series

		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000 *
Alfalfa Seed (1)											
INSPECTED AREA	(acres)	12,199	14,418	13,369	13,116	12,851	10,355	10,376	12,069	16,461	17,117
YIELD	(lbs/acre)	375	85	83	340	265	265	300	425	200	525
PRODUCTION	(tonnes)	2,075	556	503	2,023	1,545	1,245	1,412	2,327	1,493	4,076
Buckwheat											
HARVESTED AREA	(acres)	244	-	400	500	850	850	400	400	400	-
YIELD	(bu/acre)	23	-	-	-	-	-	-	-	-	-
PRODUCTION	(tonnes)	122	-	-	-	-	-	-	-	-	-
Canary Seed											
HARVESTED AREA	(acres)	6,700	1,500	6,200	20,000	10,000	25,000	10,000	20,000	10,000	7,900
YIELD	(lbs/acre)	990	-	1,470	1,100	990	950	800	950	1,400	1,100
PRODUCTION	(tonnes)	3,009	-	4,134	9,980	4,500	10,900	3,700	8,600	6,400	3,942
Corn for Grain											
HARVESTED AREA	(acres)	8,670	4,000	5,000	5,000	5,000	2,600	4,000	5,000	10,000	13,000
YIELD	(bu/acre)	92.3	55.0	100.0	100.0	100.0	96.2	100.0	90.0	80.0	110.0
PRODUCTION	(tonnes)	20,300	5,600	12,700	12,700	12,700	6,400	10,200	11,400	20,300	36,324
Corn Silage											
HARVESTED AREA	(acres)	15,000	20,000	10,000	10,000	10,000	10,000	15,000	15,000	15,000	28,600
YIELD	(tons/acre)	14.67	9.00	13.00	20.00	15.99	19.50	12.00	20.00	13.30	17.10
PRODUCTION	(tonnes)	199,600	163,300	117,900	181,400	145,100	176,900	163,300	272,200	181,400	443,672
Corn Sweet (2)											
HARVESTED AREA	(acres)	2,300	1,500	2,300	2,600	2,800	2,800	2,900	3,100	3,000	1,951
YIELD	(tonnes/acre)	5.70	2.54	3.80	6.83	6.30	6.30	5.00	5.60	6.00	6.10
PRODUCTION	(tonnes)	13,110	3,810	8,040	17,760	17,600	17,600	14,500	17,400	18,600	11,929
Fababeans											
HARVESTED AREA	(acres)	2,633	2,900	3,000	3,000	2,500	2,500	450	550	300	2,000
YIELD	(lbs/acre)	2,192	1,560	2,010	1,950	1,824	1,824	1,617	1,260	3,000	2,520
PRODUCTION	(tonnes)	2,618	2,052	2,735	2,650	2,070	2,070	330	310	400	2,286
Dry Beans											
HARVESTED AREA	(acres)	26,719	12,000	30,000	25,000	30,000	25,000	35,000	45,000	47,000	54,500
YIELD	(cwt/acre)	22.3	10.4	15.0	32.0	20.0	18.0	22.9	22.2	20.0	22.5
PRODUCTION	(tonnes)	27,050	5,700	20,400	36,300	27,200	20,400	36,300	45,400	42,700	55,622
Dry Field Peas											
HARVESTED AREA	(acres)	167,056	190,000	280,000	390,000	445,000	280,000	385,000	500,000	455,000	622,600
YIELD	(bu/acre)	36.2	29.2	39.3	35.3	34.0	40.4	40.3	35.9	42.9	35.6
PRODUCTION	(tonnes)	164,700	151,000	299,400	374,200	412,300	307,500	421,800	488,000	530,800	603,045
Lentils											
HARVESTED AREA	(acres)	12,182	45,000	30,000	40,000	38,000	20,000	25,000	15,000	22,000	34,100
YIELD	(lbs/acre)	1,198	767	690	1,075	1,250	845	732	1,180	1,245	684
PRODUCTION	(tonnes)	6,600	15,600	9,400	19,500	21,500	7,700	8,300	8,000	12,400	10,580
Mustard											
HARVESTED AREA	(acres)	59,872	35,000	60,000	90,000	100,000	85,000	145,000	110,000	90,000	84,900
YIELD	(lbs/acre)	1,119	1,266	1,180	889	1,125	753	769	795	1,100	699
PRODUCTION	(tonnes)	30,500	20,100	32,100	36,300	51,100	29,000	50,600	39,700	44,800	26,920

Source: Statistics Canada; and Alberta Agriculture, Food and Rural Development (AAFRD)

(1) Inspected acres are from Canadian Seed Growers' Association; yield and production are from AAFRD, Alberta Specialty Crop Survey

(2) Alberta Vegetable Growers (Processing)

Note: * Data shown in 2000 are from AAFRD, Alberta 2000 Specialty Crop Survey

Table 4 (Cont'd) - Alberta Specialty Crops Historical Series

		1991	1992	1993	1994	1995	1996	1997	1998	1999	2000 *
Safflower											
HARVESTED AREA	(acres)	5,200	3,500	2,500	2,300	1,850	1,850	2,400	4,000	5,000	3,000
YIELD	(lbs/acre)	1,224	535	149	1,410	1,200	1,200	1,150	800	900	---
PRODUCTION	(tonnes)	2,887	849	169	1,470	1,000	1,000	1,250	1,450	2,000	---
Sugar Beets (1)											
HARVESTED AREA	(acres)	32,779	31,127	32,432	34,836	33,656	33,463	33,124	41,132	44,522	42,017
YIELD	(tonnes/acre)	19.37	15.29	16.72	21.17	20.46	20.22	19.64	23.32	18.86	21.90
PRODUCTION	(tonnes)	634,987	475,823	542,253	737,774	688,498	676,611	650,423	959,310	839,773	920,252
Sunflowers											
AREA	(acres)	2,849	3,000	5,000	5,000	5,000	2,000	5,000	5,000	5,000	6,400
YIELD	(lbs/acre)	1,632	833	1,000	2,000	1,900	1,675	1,400	1,900	1,600	2,050
PRODUCTION	(tonnes)	2,100	1,100	2,300	4,500	4,300	1,500	3,200	4,300	3,600	5,951
Triticale											
HARVESTED AREA	(acres)	7,600	8,000	15,000	10,000	10,000	15,000	15,000	50,000	60,000	55,400
YIELD	(lbs/acre)	1,848	1,372	2,240	2,240	2,800	1,865	2,055	2,128	2,985	1,994
PRODUCTION	(tonnes)	6,500	5,000	15,200	10,200	12,700	12,700	14,000	48,300	81,300	50,098
Potatoes											
HARVESTED AREA	(acres)	27,200	26,100	27,700	29,000	29,500	31,000	30,500	32,200	42,300	47,700
YIELD	(cwt/acre)	220.0	230.0	269.0	277.8	297.7	268.0	290.0	295.0	290.0	310.0
PRODUCTION	(tonnes)	271,400	272,300	338,000	365,500	398,400	376,900	401,200	430,900	556,400	670,700

Source: Statistics Canada; and Alberta Agriculture, Food and Rural Development (AAFRD)

(1) Alberta Sugar Beet Growers 2000, 76th Annual Report

Note: * Data shown in 2000 are from AAFRD, Alberta 2000 Specialty Crop Survey

Table 5 - Western Canada Specialty Crops Area and Production

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000*
Mustard				**Seeded Area**		**'000 acres**				
Alberta	59.9	45.0	60.0	90.0	100.0	90.0	145.0	110.0	100.0	90.0
Saskatchewan	202.7	240.0	400.0	700.0	550.0	490.0	560.0	580.0	585.0	465.0
Manitoba	16.3	10.0	10.0	10.0	10.0	11.0	17.0	10.0	7.0	10.0
Western Canada	278.9	295.0	470.0	800.0	660.0	591.0	722.0	700.0	692.0	565.0
				Production		**'000 tonnes**				
Alberta	30.5	20.1	32.1	36.3	51.1	29.0	50.6	39.7	44.8	26.9
Saskatchewan	81.7	109.7	180.0	278.9	190.6	196.9	186.5	195.5	259.7	185.1
Manitoba	8.9	3.5	3.8	4.1	2.6	4.9	6.3	3.4	1.9	3.3
Western Canada	121.1	133.3	215.9	319.3	244.3	230.8	243.4	238.6	306.4	215.3
Sunflowers				**Seeded Area**		**'000 acres**				
Alberta	2.8	4.0	5.0	5.0	5.0	2.0	5.0	5.0	5.0	6.5
Saskatchewan	17.5	20.0	80.0	60.0	40.0	25.0	35.0	40.0	65.0	25.0
Manitoba	182.4	160.0	125.0	140.0	75.0	63.0	85.0	125.0	140.0	155.0
Western Canada	202.7	184.0	210.0	205.0	120.0	90.0	125.0	170.0	210.0	186.5
				Production		**'000 tonnes**				
Alberta	2.1	1.1	2.3	4.5	4.3	1.5	3.2	4.3	3.6	6.0
Saskatchewan	8.2	8.4	29.0	25.9	18.4	15.7	14.3	21.3	35.4	12.4
Manitoba	124.3	55.3	47.2	86.6	43.5	37.7	47.6	86.2	82.9	101.8
Western Canada	134.6	64.8	78.5	117.0	66.2	54.9	65.1	111.8	121.9	120.2
Lentils				**Seeded Area**		**'000 acres**				
Alberta	12.2	50.0	40.0	40.0	40.0	20.0	25.0	20.0	25.0	35.0
Saskatchewan	442.8	475.0	750.0	830.0	735.0	690.0	780.0	900.0	1210.0	1660.0
Manitoba	133.5	165.0	130.0	115.0	50.0	40.0	8.0	15.0	16.0	35.0
Western Canada	588.5	690.0	920.0	985.0	825.0	750.0	813.0	935.0	1251.0	1730.0
				Production		**'000 tonnes**				
Alberta	6.6	15.6	9.4	19.5	21.5	7.7	8.3	8.0	12.4	10.6
Saskatchewan	272.2	254.0	315.2	381.0	381.9	373.8	365.2	465.9	702.6	888.1
Manitoba	64.0	79.4	24.1	49.9	28.5	21.0	5.3	5.9	8.8	16.1
Western Canada	342.8	349.0	348.7	450.4	431.9	402.5	378.8	479.8	723.8	914.8
Dry Field Peas				**Seeded Area**		**'000 acres**				
Alberta	167.1	200.0	300.0	400.0	465.0	290.0	385.0	510.0	470.0	640.0
Saskatchewan	195.8	350.0	750.0	1110.0	1350.0	900.0	1500.0	1900.0	1520.0	2240.0
Manitoba	127.4	125.0	200.0	210.0	180.0	145.0	205.0	260.0	105.0	155.0
Western Canada	490.3	675.0	1250.0	1720.0	1995.0	1335.0	2090.0	2670.0	2095.0	3035.0
				Production		**'000 tonnes**				
Alberta	164.7	151.0	299.4	374.2	412.3	307.5	421.8	488.0	530.8	603.0
Saskatchewan	160.6	244.9	585.1	898.1	868.2	729.4	1158.0	1613.9	1623.4	2072.4
Manitoba	84.4	108.9	85.7	168.7	147.0	132.0	178.3	225.9	92.0	160.5
Western Canada	409.7	504.8	970.2	1441.0	1427.5	1168.9	1758.2	2327.7	2246.2	2835.9
Canary Seed				**Seeded Area**		**'000 acres**				
Alberta	7.0	2.0	0.0	0.0	10.0	25.0	10.0	20.0	15.0	12.0
Saskatchewan	215.1	215.0	300.0	480.0	330.0	520.0	250.0	450.0	340.0	360.0
Manitoba	20.1	18.0	12.0	25.0	25.0	70.0	20.0	50.0	15.0	40.0
Western Canada	242.2	235.0	312.0	505.0	365.0	615.0	280.0	520.0	370.0	412.0
				Production		**'000 tonnes**				
Alberta	3.0	1.0	0.0	0.0	4.5	10.9	3.7	8.6	6.4	3.9
Saskatchewan	93.0	116.8	124.7	226.8	137.9	240.0	102.1	201.8	152.0	148.6
Manitoba	7.3	7.3	3.1	13.6	12.2	33.7	9.2	24.9	7.6	17.2
Western Canada	103.3	125.1	127.8	240.4	154.6	284.6	115.0	235.3	166.0	169.7

Source: Statistics Canada; Saskatchewan Agriculture and Food; and Alberta Agriculture, Food and Rural Development (AAFRD)

* Data shown in 2000 for Alberta is taken from AAFRD, Alberta 2000 Specialty Crop Survey

MARKET OUTLOOK FOR SELECTED SPECIALTY CROPS

By Charlie Pearson

Dry Field Pea Markets

Feed peas have been a success story over this past year, reflecting our ability to sell a record Alberta and Western Canadian crop at relatively high prices. The growth in the demand side came both from the edible and the feed market (both domestic and export). Smaller crops in India (the major pulse crop consumer in the world) and Australia (a major supplier of pulse crops to Southeast Asia) created additional export opportunities for edible peas. On the feed pea side, a smaller European pea crop combined with the meat and bone meal ban resulted in a substantial increase of Canadian feed peas being exported to this region. Feed peas are becoming increasingly more popular in domestic rations as both an energy and protein source. The end result will be a very tight carryover at the end of the 2000/2001 crop year.

The coming year will be challenging again given another record Western Canadian acreage. High nitrogen fertilizer prices and farm managers who have found a good fit for peas within their crop rotations are the major factor in this increase. Statistics Canada seeding intentions survey forecasts Western Canadian pea acreage at 3.6 million acres for 2001, up over 15 per cent from the record 2000 acreage of 3.1 million acres.

Larger European pea production, combined with lower priced soybean meal will keep feed pea prices under pressure. The continued ban on the use of meat and bone meal in European feed rations will allow a continued large export program for feed peas during the first half of the crop year, but this is likely to slow during the last half of the crop year. A positive result of this is that feed peas will continue to be competitively priced into domestic feed rations as an energy source with the implication of continued increases in rations. Look for domestic feed pea prices to hold in the $3.25 to $3.75 per bushel range in the coming year.

Larger pulse crops in Southeast Asia (our major importer) and Australia (major competitor) will result in lower edible pea prices in the coming year. Canada will have good opportunities to move similar volumes to the

2000/2001 crop year, but likely at prices closer to $4.00 to $4.50 per bushel versus the $4.50 to $5.00 per bushel range of the past six months.

Lentil Markets

Larger Canadian and world lentil production has kept prices under pressure this crop year, with a range of 13 to 16 cents per pound for green lentils and 15 to 17 cents per pound for red lentils, versus 20 to 24 cents per pound in 1999/2000. World lentil production has grown from about 2.2 million tonnes in 1997/1998 to about 2.7 million tonnes in the current crop year with increased production in Canada, Australia and the United States offsetting declines in Turkey. The driving force has been strong competition among the major lentil exporters. The export market is somewhat segregated in that Turkey and Australia mainly export red lentils, whereas Canada has mainly exported green lentils.

Western Canadian farm managers are forecast to have seeded 1.6 million acres to lentils this spring, down about 7 per cent from 2000. The acreage seeded to the different types of lentils will also shift slightly with red lentil (Crimson) acres increasing, small seeded varieties (Eston, Milestone) staying relatively stable, and larger seeded types (Lairds) coming down.

Assuming average yields in the 1,100 to 1,200 pound per acre range and a normal quality distribution, prices for all classes of top quality lentils should hold in the 13 to 15 cent per pound range, with large seeded types more likely at the top end of the range and red lentils more likely at the bottom end. Increased production in Turkey and Australia will likely pressure red lentil prices lower than current values.

Chickpea Markets

World chickpea production dropped to just over 5.5 million tonnes this last year versus 6.5 million tonnes normally. The major shortfall in chickpea supplies occurred in India with production of 4 million tonnes, down 1 million tonnes from 1999. Canadian chickpea production in 2000 was a record 388,000 tonnes. The increase in production has been close to amazing given that virtually none of this crop was grown in Canada six years ago. The additional supplies will allow chickpea exports to triple compared to previous

years. Domestic use will also be up this year, reflecting increased use in domestic livestock feed rations.

Chickpea prices for premium quality kabuli chickpeas have ranged from 33 to 38 cents per pound for 9 mm size, 30 to 33 cents per pound for 8 mm, and 25 to 29 cents per pound for 7 mm. Desi chickpeas started out in the 12 to 14 cent per pound range last fall, but have since increased to the 16 to 18 cent per pound range.

Western Canadian farm managers seeded about 900,000 acres of chickpeas this spring, with about 40 per cent seeded to desi and 60 per cent to kabuli. Based on average yields of about 1,100 pounds per acre, this would result in production of 450,000 tonnes. Larger chickpea crops are forecast in India, Australia and Turkey. This will likely result in somewhat lower prices in the coming year. New crop chickpea prices are hard to find this summer but early indications are 9 mm kabuli offers in the 25 to 28 cent per pound range, 7 mm varieties such as B90 and Chico types in the 18 to 20 cent per pound range and desi prices in the 15 to 16 cent per pound range.

Mustard Seed Markets

Western Canadian mustard production in 2000 was just over 200,000 tonnes, a 50 per cent decrease from 1999. Canadian mustard exports averaged about 160,000 tonnes, with quantities distributed equally between the US (mainly yellow mustard), Europe (mainly brown mustard) and Southeast Asia (mainly oriental). Domestic use averages about 70,000 tonnes per year. Brown and oriental mustard prices have averaged in the 11 to 12 cent per pound and 10 to 11 cent per pound range, respectively, over the past year. Yellow mustard seed prices were around 15 cents per pound during the first nine months of the crop year, but have since increased to the 19 to 20 cent per pound level, reflecting concerns about the lower mustard acreage in 2001 and the impact of the dry spring on yield prospects.

Mustard seed acreage in the coming year is expected to be about 312,000 acres, a 40 per cent decrease from 2000. Most of the reduction in acreage will be in the brown and oriental varieties of mustard. A tighter Canadian mustard seed supply has resulted in higher new crop prices, with current deferred delivery contract offers for yellow mustard around 17 cents per pound, and brown/oriental prices in the 13 to 14 cent per pound range.

Economics of Specialty Crop Production

By Nabi Chaudhary

Costs and returns for livestock, crops and several other enterprises have been monitored in the province in an extensive way since the 1960's. These studies have been viewed as an important tool for assisting producers in their cropping decisions and the federal and provincial governments in developing policies and programs for different farm enterprises. Where information gaps existed in other provinces, results from these studies have served as the basis to fill those gaps.

The Economics Unit (formerly known as Production Economics Branch) in the Economics and Competitiveness Division of Alberta Agriculture, Food and Rural Development has been conducting economic studies on various farm enterprises for the last several decades. Since the early nineties, much greater emphasis has been placed on developing costs and returns data on specialty and/or alternative crops for farm diversification purposes. Because of continued depressed prices and volatile markets for traditional cereals and oilseeds, producers have been looking into diversifying their operations into new and emerging specialty crops. As mentioned above, results from these studies have been very helpful to primary producers when making cropping decisions. Furthermore, individual producers have also used the results from these studies to compare costs and returns and profitability margins of their farms with the group averages from the respective areas in order to develop better management practices. Agri-businesses and other stakeholders have used the results of the economic studies for feasibility purposes.

The following tables provide information on production costs and returns for dry field peas and chickpeas (the new cinderella crop on the prairies):

Table 6 - Production Costs and Returns for Dry Field Peas, in Dark Brown Soil Zone, 2000

	$ per Acre	$ per Bushel
Revenue per Acre		
Yield per Acre (bushels)	37.62	
Expected Market Price/Acre ($)	4.02	
(a) Gross Revenue per Acre	**151.23**	**4.02**
Expenses per Acre ($)		
Seed and Seed Cleaning	24.96	0.66
Fertilizer Rates: 2N 16P 1K 3S	5.64	0.15
Chemicals	27.17	0.72
Hail/Crop Insurance Premiums	7.43	0.20
Trucking and Marketing	1.39	0.04
Fuel	7.46	0.20
Repairs - Machinery & Buildings	10.21	0.27
Utilities & Miscellaneous Expenses	10.89	0.29
Custom Work & Labour	6.40	0.17
Operating Interest Paid	2.59	0.07
Unpaid Labour	3.10	0.07
(b) Variable Costs	**107.24**	**2.84**
Cash/Crop Share Rent	16.36	0.43
Taxes, Licenses & Insurance	9.56	0.25
Equipment & Building - Depreciation	17.85	0.47
Paid Capital Interest	6.95	0.18
(c) Capital Costs	**50.72**	**1.35**
(d) Total Production Costs (b+c)	**157.96**	**4.20**
Gross Margin	**19.12**	**0.51**
Return to Investment (a-d+capital interest)	**6.31**	**0.17**
Return to Equity (a-d)	**-0.64**	**-0.02**

Note: Above information is based on data obtained from producers for the 2000 dry field pea crop.

Source: Economics Unit, Alberta Agriculture, Food & Rural Development
Edmonton, Alberta (780) 422-4054

Table 7 - Crop Budgets for Desi and Kabuli Chickpeas Production Costs and Returns ($ per Acre)

	Desi Chickpeas	Kabuli Chickpeas
Revenue Per Acre		
Estimated Yield per Acre (lbs)	1100	900
Price per Pound ($)	0.13	0.28
(a) Gross Revenue per Acre ($)	**143.00**	**252.00**
Expenses per Acre ($)		
Variable Expenses per Acre		
Seed	21.95	50.40
Fertilizer	11.77	11.77
Chemicals	16.25	18.25
Machinery Expenses (Fuel & Repair)	14.5	14.5
Custom Work & Hired Labour	5.00	5.00
Utilities & Miscellaneous	3.01	3.01
Interest on Variable Expenses	2.97	4.12
(b) Total Variable Expenses	**75.45**	**107.05**
Other Expenses per Acre		
Building Repair	1.05	1.05
Property Expenses, Insurance & Licences	5.2	5.2
Machinery & Building Depreciation	16.85	16.85
Machinery & Building Investment	11.54	11.54
Land Investment	25.00	25.00
Labour & Management	14.75	14.75
(c) Total Other Expenses	74.39	74.39
(d)TOTAL PRODUCTION COSTS (b+c)	**149.84**	**181.44**
RETURNS PER ACRE ($)		
Return Over Variable Expenses (a-b)	67.55	144.95
Return Over Total Production Costs (a-d)	-6.84	70.56

Note: Returns per acre would vary with yield and price.

New Crop Development Unit

Dr. Stan Blade, Unit Leader

The mission of the New Crop Development Unit (NCDU) is to ensure that applied research, industry development and technology transfer activities are appropriately channelled to support the special crop industries in Alberta. This is consistent with the market-driven thrust of Alberta Agriculture, Food & Rural Development (AAFRD) programs and also fosters sustainable agricultural production. NCDU clients include primary producers, commodity organizations, agribusiness, food processing companies, Agriculture and Agri-Food Canada personnel, university scientists and other specialists, both within and out-of-province. The NCDU exists to promote and support crop diversification and value-added initiatives in Alberta.

The New Crop Development Unit is one of five work units within the Plant Industry Division (PID) of Alberta Agriculture, Food and Rural Development.

Special crops are defined as alternative or non-traditional crops that generally are grown on small acreages, often under contract, and usually outside the control of the Canadian Wheat Board. This definition is not bound by acreage, and it is recognized that crops designated as "special crops" will change over time. Some examples of special crops currently being grown on a commercial scale in Alberta include buckwheat, canary seed, caraway, chickpeas, coriander, corn, dill, dry bean, faba bean, field pea, chickpea, low-THC hemp, ginseng, lentil, medicinal plants, mustard, peppermint, safflower, spearmint, sugarbeet, sunflower, wild rice, and miscellaneous herbs and spices. NCDU programs encompass all of these crops, with emphasis on those of greatest economic importance.

Most special crops are produced under contract or for direct marketing, and much of Alberta's production is exported. There is considerable value-added processing of crops such as mustard, sugar beet and herbs and spices. Others, such as sunflower, lend themselves to consumer marketing. The value of processed special crops in Alberta has not been established.

The NCDU receives strategic direction directly from the crop and processing industries it serves, as well as from commodity organizations, e.g. the Alberta Pulse Growers Commission and the Alberta Special Crop, Horticulture and Forage Product Teams. All programs in the Unit are reviewed every three years by scientific colleagues and industry representatives, including producers, processors and agribusinesses.

The following programs currently comprise the NCDU: administration, plant pathology, post-harvest technology, soil and water agronomy, special crops, and weed science. All of these programs are represented at CDCS. In addition, there are NCDU staff at CDCN (special crops, farm team, administration and apiculture) in Edmonton, Fahler (apiculture) and the Beaverlodge Research Farm (special crops). The New Crop Development Unit work in close collaboration with AAFRD Pulse and Special Crops Specialists:

Paul Laflamme-Grande Prairie
Elaine Stenbraaten-Manning/Fairview
Trevor Kloeck-Stony Plain
Randy Bjorklund-Lamont
Kirsty Piquette-St. Paul
Terry Buss-Vermilion
Mark Olson-Lacombe
Sandra Taillieu-Olds
Mike Clawson-Lethbridge

Special Crops Program (Edmonton)

S.F. Blade, N. Clark and L. Maskewich

Alberta producers are interested in diversifying their production. This was true in 2000 as prices for several conventional crops continued to tumble. One successful strategy is to incorporate new crops into the farming system. The special crops program is dedicated to introducing new crops that will contribute to the long-term viability of agriculture in the province. Diversification can contribute to improving crop rotations through inclusion of pulse crops, reduce the impact of price volatility on producers dealing in traditional crops, and expand opportunities for value-added processing in Alberta. Both large-scale conventional farmers and less-experienced entrepreneurs who wish to become involved in intensive production and processing opportunities presented for specific new crops are served.

2000 was a productive year for the special crops program at CDCN. Agronomic research capabilities were expanded with:

- The purchase of a Fabro no-till precision drill, to keep up with the current agricultural trend of direct seeding;
- The modification of Wintersteiger combine with new screens that widen harvesting capabilities;
- The utilization of the knowledge of Ken Lopetinsky, Provincial Pulse Agronomist, to expand the extension services of CDCN;
- The addition of Rachid El Hafid, Ph.D., who will work out of the Beaverlodge Research Farm and provide a northern perspective to the new crops research collected out of CDCS and CDCN; and
- Representation on the Provincial Pulse and Special Crops Team, AAFRD Special Crops Product Team, the Information Technology Committee, the Applied Research Strategy Group, and the Alberta New Crops Network.

Research Projects

The special crops program at CDCN has been active in the identification and development of promising economic crops since 1995. The focus has been research on several categories of new crops: pulse, spice, alternate, herb (medicinal, culinary and aromatic) and fibre crops.

Pulse Crops

Western field pea cooperative trial

In 2000, the special crops program entered three yellow and one green cotyledon breeding lines into the Western Field Pea Cooperative Trial. The lines performed very well; it is anticipated that after the second (and final) year of mandated testing that at least one of the lines will be registered and released for western Canadian growers.

Field pea breeding and germplasm evaluation

CDC Advance—To jumpstart the field pea breeding program CDCN staff were able to collaborate with the Crop Development Centre in Saskatoon to obtain early-generation lines from crosses which were targeted to the cool, moist conditions of Alberta. Following original unreplicated screening in 1996, a replicated preliminary yield trial in Edmonton and Grande Prairie in 1997 was completed. The elite material was put into an ongoing yield test in several locations in Saskatchewan and Alberta.

In 2000, a formal agreement was signed between the Alberta Pulse Growers Commission and the University of Saskatchewan pulse breeding programs to ensure that superior genetic material will be available to farmers in each province. These commissions have guaranteed long-term funding for the CDCN breeding program; and discussions are underway to include lentils and chickpeas into the agreement.

AAFRD/AAFC Breeding Agreement—In 1997 an agreement was signed between CDCN and the Agriculture and Agri-Food Canada Field Pea Breeding Program based in Morden, Manitoba. Approximately 200 lines were tested in 2000; the best lines will be determined and evaluated and by multilocation testing in 2001.

CDCN—1999 pea lines crossed in the greenhouse were planted in the field for the 2000-growing season. This new material will be evaluated with several objectives in mind: plant maturity, height, harvestability, plant architecture, disease resistance, seed vigor, and yield.

CDCN also collaborated with the University of Saskatchewan's pulse breeding program to increase seed yield of pea, bean, lentil and chick pea lines; and out-planted numerous selections from the World Germplasm Bank to examine pea lines that have economic potential as a sound agriculture crop for our region.

Intensive pea management (IPM)

The IPM Trial was originally set up in 1998 to evaluate the impact of four major management issues in the production of field pea across Alberta. Preliminary results indicate that rate of seeding and date of fungicide application were the two important variables affecting this study, which led to a shift in focus for the 2000 season, allowing us to concentrate on issues that have a direct affect on the growers.

Field pea inoculant trials

The first year of this experiment in collaboration with the Agriculture Canada Research Stations in Lacombe and Beaverlodge was conducted in 2000. The basis of the experiment was to determine the effects of inoculant formulations on nodulation (the symbiotic relationship between *Rhizobia* spp. and legumes).

New Millennium Silage Trial

2000 was also the first year for the new millennium silage trial. This experiment was conducted at four locations across Alberta (Vermillion, Barrhead, Grande Prairie, and Edmonton). The purpose of this trial was to look at protein content of grain and field pea intercropping at flat pod stage. The treatments incorporated varying levels of a cereal (barley or triticale) and Swing or Performance 4010 field pea.

Pulse crop screening (lentil, faba bean, chickpea)

In collaboration with several seed companies and breeding programs lentils lines were tested in Vermilion (in cooperation with Terry Buss), chickpea lines and faba bean (at CDCN). In collaboration with Randy Bjorklund the silage potential of ten faba bean lines was assessed by collecting data on biomass production and feed analysis. In collaboration with CDCS personnel four excellent fenugreek lines that have good nutritional composition and maintain forage quality until late in the season were evaluated.

Alternate Crops

Special crops adaptation trials

A screening/demonstration trial was planted at CDCN. This trial was used to assess the potential of crops like millet, grass, and specialty pea varieties for the central region of Alberta.

Herb Crops

Herb screening (medicinal, culinary, aromatic)

Approximately 200 species of annual, perennials, and tender perennials were started in the greenhouse, and transplanted and direct seeded in the field. This provided the research team with a preliminary screening process for a wide array of herbs that could have commercial potential in Alberta. The perennial herbs were left undisturbed to identify species that can overwinter.

Mint latitude trial

Mint is an economically important crop with potential for commercial production in Alberta. The second year of the mint latitude trial to was conducted this year to determine plausible growing regions, and if latitude affects essential oil content of spearmint and peppermint. Trials were planted in Edmonton, Brooks, Lethbridge, St. Paul, and Grande Prairie and monitored for disease and winterkill. The mint was harvested in the fall and sent to CDCS for distillation.

Fibre Crops

Low THC hemp research

In 2000 low THC hemp research at three locations in collaboration with two private growers continued. Silage, rate of seeding and varietal trials were conducted at CDCN, in Kirriemuir, and in Hamruka, Alberta. Preliminary results indicate rainfall is essential for a profitable harvest.

Technology Transfer Services

Due to the high interest in special crops, staff was called upon to answer numerous enquiries regarding a range of new crop opportunities relating to pulse, spice, medicinal and fibre crops. Staff contributed articles on crop diversification and species-specific topics to producer newsletters, industry periodicals and provincial newspapers. The interest in crop diversification resulted in several media interviews that were the source for further enquiries from the general public.

The demand for increased knowledge regarding new crops resulted in courses, seminars and field tours. The Special Crops Field Day held at CDCN was a tremendous success; and our total number of tour participants throughout the year totaled more than 500 individuals. CDCN staff also assisted members of the Pulse and Special Crops Team with obtaining planting materials for demonstrations across the province, and distributing technical information to clients.

A new innovation was involvement in Ask The Expert and Agri-Ville electronic forums provided an opportunity for staff to interact directly with producers in a new and highly effective forum. Clients included producers, other AAFRD Units, universities, Agriculture and Agri-Food Canada, other provincial agriculture departments, applied research associations and agri-industry. Many of the trials were done as researcher-managed on-farm experiments, which allowed neighbors to view technological innovations in their own area. Program staff served as college and university guest lecturers, independent study course mentors (U of A) and resource people for a number of industry organizations.

The special crops program would like to acknowledge the contribution of Jackie Tieullie, Jo-Ann Berry, Sandy Smith, Tracey Dryden, Linzi Martin, Jennifer Walychow and Nadia Geschke for their assistance in 2000.

Special Crops Program (Barrhead)

K.J. Lopetinsky

Crop diversification by incorporating pulse crops in the rotation is greatly benefiting producers with greater stability of income and new marketing strategies. Further value-added processing will enhance these benefits. Present concerns of high nitrogen fertilizer costs will further increase pulse acres and the use of pulse products.

The present pulse research program at Barrhead is a growing partnership of AAFRD Specialists (including CDCN), private industry (Alberta, Canada, and International), the Gateway Research Organization, as well as key participation from the Alberta Pulse Growers (Zones 3, 4 and 5). The projects are primarily on field pea agronomic parameters with some work being conducted on fababean cultivars and agronomy.

Funding for all projects is being obtained either from the pulse industry sponsors or through AARI On Farm Demonstration program.

Additions in year 2000 included securing funding and construction of a drying oven (200 sample size) at Barrhead and the construction of a 50 foot, 3 point hitch, plot sprayer for the research program.

Research Projects

The AAFRD team in conjunction with APG-Zone 3 has developed pulse research and demonstration programs dating back to 1984. In 2000, the priorities and projects were developed by industry needs with assistance from various AAFRD staff and coordinated and conducted by Ken J. Lopetinsky with assistance from APG-Zone 3 staff: Glen Pullishy and Sheryl Strydhorst.

Western Canada field pea co-operative trial

One of the 12 sites across Western Canada is maintained at Westlock, representing a total of 82 cultivars in three blocks. Complete agronomic data, yield and samples for food quality analysis were collected and submitted to Morden, Manitoba. Results are published in the Prairie Registration Recommending Committee for Grain—Special Crops Subcommittee Report (annual). Data is used to support registration of new field pea cultivars.

Alberta region pulse trials

Evaluation of 22 cultivars in the yellow pea regional and 14 cultivars in the green pea regional were conducted at two locations to provide Alberta producers with updated variety data. These two sites are part of Area 3 data for the provincial program and results are published annually in Agdex 140/32-1, *Varieties of Special Crops for Alberta*. In addition, eight fababean cultivars were tested at two locations.

Pre screening and evaluation of new field pea genetics

In partnership with Advanta Seeds (Winnipeg, Manitoba) and Cebeco Zaden (the Netherlands), a total of 26 cultivars were pre screened for adaptability at six locations — two Advanta Seeds locations and four Cebeco locations. Further partnering with Randy Bjorklund, AAFRD and Robyn Russell, Agricore provided two locations outside Area 3 (wet zone) with locations at Andrew and Camrose.

In addition, Plant Breeder Rights (PBR) tests and descriptions were conducted for Advanta and Cebeco on 14 field pea candidate cultivars and one fababean candidate cultivar against recognized reference cultivars. This is a two-year data collection and variety description process funded by private industry.

Fababean trials — new genetics

In partnership with St. Denis Seeds and several producers, two new Fababean types with European genetics were monitored at various locations. Additional cooperation from BASF (formerly Cyanimid) was incorporated to research several herbicides for broadleaf weed control in fababeans at three locations. Some herbicides show great promise and the project will be continued in 2001.

Pea inoculant research program

Biological signal molecule field pea inoculants were evaluated with first year partners AAFC (Lacombe) and Bios Agriculture (Quebec). This study was conducted at three locations and overseen by team leader Dr. George Clayton. Testing new legume inoculants for optimum nitrogen fixation and yield is important and requires further study. In addition, a partnership with MBR (MicroBioRhizogen), Saskatoon, Saskatchewan was established to evaluate new strains of field pea inoculant and compare various formulations. Partnered with LiphaTech, another study was organized to evaluate phosphate effects on granular inoculant viability when mixed. Time intervals included 0, 1, 2, 3 days and yield comparisons were made with and without the added phosphate in the seed row. First year data is promising and the project will be continued in 2001.

New millennium silage trial

In partnership with Pulse and Special Crops Specialists, four locations were seeded (Oliver, Barrhead, Vermilion, Grande Prairie) to compare various seeding rates of Barley and Triticale with Swing and Performance 4010 field pea as well as sole crop to intercrop mixtures. Biomass yield and crude protein were determined for 16 treatments at each location. The program was developed at Barrhead, where all seed ratios for all seed plots were supplied (total of 320 sub plots). Graphs for biomass yield, per cent crude protein, and crude protein yield were developed at Barrhead for each location.

Field pea research partnership with Alberta pulse growers — Zone 3

Based on priorities set by a committee, this is a continuing program that provides new information affecting profitable production of field pea in Alberta. Projects include: Evaluation of Soil and Foliar Micronutrients on Field Pea Yield; Evaluation of Special Purpose Field Pea Cultivars; Field Evaluation of Ascochyta Blight Control on Field Pea; Evaluation of Two Gramminicide Application Dates for Field Pea Yield and Grassy Weed Control; Evaluation of New Field Pea Varieties in Northwest Alberta.

In addition the following two new projects will commence in 2001: Effects of Seeding Date and Chemical Seed Treatments on Rhizoctonia Blight of Field Pea; Lygus Bug Control in Fababean Crops in NW Alberta.

Technology Transfer Services

The further development of a Team Approach to Agronomic Research resulted in more technology transfer activities in new areas of the province. This included presentations at the annual meetings of Zone 2, 3, and 4 of the Alberta Pulse Growers. A total of seven field tours were conducted with industry partners to see first hand differences in various project treatments of many programs in the area. Attendance has kept pace with the number of tours, however future changes are planned to better facilitate train the trainer activities. In 2000, a team approach developed the new pulse and new crops modules at the Ellerslie Diagnostic School, providing a new method of technology transfer for many specialists. Written articles and radio talks highlighted the pulse industry's new results in 2000.

Special Crops Program (Brooks)

M. Bandara, C. Wildschut, E. Russell, L. Ost, T. Simo and J. Webber

The special crops program at the CDCS at Brooks is primarily responsible for the evaluation, introduction, and development of alternative, or new (special) crops for southern Alberta through applied and adaptive research projects. Some study projects are conducted in collaboration with other research programs at CDCS, other divisions of Alberta Agriculture, Food and Rural Development (AAFRD), Agriculture and Agrifood Canada, University of Alberta, the Crop Development Centre at the University of Saskatchewan, Regional Research Associations and industry partners. Different funding sources such as Farming for the Future Matching Grants and Direct Funding Grants, regional and cooperative varietal testing programs and several processing industry partners, provide the financial support for the programs.

Agronomic and physiological studies are conducted on pulses, herbs and spices, medicinal and essential oil crops. Considerable time is invested on new cultivar/line and species evaluation studies. A small component of the program is the testing of new cultivars and breeding lines of cereals and oilseeds under irrigation.

Detailed project results are presented in CDCS pamphlet 2000-20, *Special Crops Cultivar Trials*.

Research Projects

Regional/cooperative trials

Newly developed breeding lines and promising cultivars of lentils, chickpeas, drybeans, fieldpeas, fenugreek, and mustard received from various crop breeding programs are evaluated under dry land and irrigated conditions in southern Alberta, to select suitable cultivars/lines for the region.

Drybean cultivar evaluation and cultural practices

Ten yield tests, with various drybean lines and varieties, were conducted at Brooks and Bow Island under irrigated conditions to gather data for screening, registration and recommendation purposes.

Breeding programs at the Lethbridge Research Center, Agriculture and Agrifood Canada and the Saskatoon Crop Development Centre at the University of Saskatchewan, are developing promising lines of this type of drybean. Four lines B one great northern, one black and two navy B were recommended for varietal registration by the Prairie Registration Recommending Committee for Grains (PRRCG).

Three irrigated locations in southern Alberta were established to test these newly registered cultivars in wide and narrow row configurations, under auspices of the Special Crops Regional Varietal Testing Program.

Other pulse crops cultivar evaluation and cultural practices

Twelve fieldpeas cultivar trials were conducted at Brooks, Bow Island, Standard, Douglas Farm (a dry land test site north of Brooks), Barons and Milk River to evaluate lines and varieties for screening and regional adaptation purposes. Brooks was the only irrigated site. Four yellow and six green type fieldpea lines were recommended for varietal registration by the PRRCG in 2000. Most lines were higher yielding than Carneval, generally earlier maturing and showed acceptable disease resistance and quality characteristics. In 2000, 26 sites in different geographic regions and soil zones of Alberta and the Peace region of British Columbia were established to test these newly registered fieldpea varieties.

Different lines and registered varieties of other pulse crops, such as lentils, chickpeas and soybeans were again evaluated for registration and regional adaptation. Five kabuli and five desi type chickpea regional tests were established under dry land conditions at Bow Island, Brooks, Standard, Barons and Carmangay. All sites were harvested, but due to severe drought only the kabuli type test at Bow Island and the desi type tests at Standard, Douglas Farm and Bow Island produced marginally reasonable yields.

Other special crop cultivar evaluations and cultural practices

Several cultivars and lines of canary seed, mustard, natto soybeans, fenugreek and hybrids of sunflowers, silage and grain corn were evaluated for potential registration and regional adaptation.

Cereal Yield and Varietal Trials

Three barley and four wheat trials were conducted under irrigation at Brooks in conjunction with the Field Crop Development Center in Lacombe. The barley tests included 2 row (15 lines), 6 row (14 lines) and hulless (12 lines); the wheat tests included soft white spring (6 lines), hard red spring (19 lines), durum (11 lines), and a utility test (15 lines) combined with triticale (6 lines). Data was collected throughout the season for growth habits, disease, pests, maturity and yield. The tests suffered from poor and uneven germination, but recovered sufficiently during the growing season. Maturity data were very variable and were not used. Samples of the hard red spring wheat were forwarded to Agricore for protein analysis.

Oilseed Yield and Varietal Testing

One flax trial (12 lines) and three canola trials (one rapa with 4 lines and two napus with 28 lines in each trial) were established at CDCS. Again, there was low and uneven germination, resulting in uneven maturity. Data collected was similar to cereal trials.

Fall Seeding Studies

Fall seeding or dormant seeding refers to the planting of a crop species in the fall before freeze-up. The seed remains dormant in the soil during fall and winter months, and germinates in spring when conditions are favorable.

Using the canola crop model, fall seeding studies were established at Beaverlodge, Edmonton and Brooks, using four spice crop species (coriander, dill, anise and mustard) and two pulse crop species (lentils and chickpeas). Different seeding rates (1 x, 2 x and 4 x) and seed-coated with plastic polymers were the treatments. Crop performance will be compared with spring seeded crops.

Fifteen lentil cultivars from the Crop Development Centre of the University of Saskatchewan were seeded at CDCS in the fall of 2000. One half of the seed of each cultivar was coated with plastic polymer and the other half was uncoated (untreated control). Cultivar and coat treatment effects on winter survival, crop growth and seed yield will be assessed in the 2001 cropping season. Crop phenology and seed quality will be compared with the spring-seeded crop.

Seed Priming Studies

Coriander, a member of the *Apiaceae* (*Umbellifecae*) family is characterized by slow and erratic germination and poor seedling emergence. Previous studies have shown that seed priming can enhance and synchronize seed germination in several slow germination species. A study was conducted using two cultivars of coriander (small-fruited cultivar PGR 5741 and larger-fruited cultivar ND-1) to evaluate effect of different priming treatments (water for 24 or 36 h, 0.5 or 0.75 per cent ethyl alcohol for 12 h) on seedling establishment, plant growth, crop maturity and fruit yield. Results indicated that priming treatments improved the stand establishment, but had no effect on final plant height or fruit yield. All priming treatments produced an evenly matured crop compared to the untreated control. The treatments, however, had no impact on the time of maturity. Uniform crop maturity would be the main beneficial effect of the priming treatment for coriander.

Evaluation of Calendula as an Industrial Crop for the Prairies

Calendula is a flowering annual grown as an ornamental and medicinal plant throughout the Prairies. Calendula flowers have been used as a source of medicinal ingredients for over 100 years. The medicinal compounds include triterpenes, flavonoids, carotenoids, polysaccharides and sterols that contribute to the anti-inflammatory and immuno-stimulatory properties of the plant. Calendula also accumulates a fatty acid in its

seed oil, which is known as calendic acid. This is the most rapidly oxidized fatty acid known in nature and as such has an extensive number of applications in the plastics, paints and coating industries. Two separate studies were established to evaluate the effect of genotype, location, seeding rate, seeding date, late flower bud removal, on crop growth, seed yield, seed oil content and oil composition under field conditions in southern Alberta.

Study 1—Calendula cultivar x seeding date study: This study included two cultivars, Resina (yellow flowered, early maturing and large seeded) and Erfurter Orangefarbigen (orange flowered, late maturing and small seeded) and three spring seeding dates (May 3, 18 and 31). The crop was grown with supplementary irrigation. Both cultivars seeded on May 3, 18 and 31 were harvested on August 25, September 7 and October 12 respectively, indicating that crop maturity of the two cultivars was comparable under the growing conditions in the 2000 cropping season. In both cultivars, the early seeded crop produced higher quality seed compared to that of the late seeded, even though seeding date had no significant impact on total seed yield.

Study 2—Seeding rate x date for flower bud harvest: This study was established on May 18, 2000 using calendula cultivar Erfurter Orangefarbigen at two seeding rates, 6 and 12 kg/ha in a randomized complete block design. Late flower bud harvest treatments were imposed at 3 growth stages, early stage of seed formation (Aug 13), green seed stage (Aug. 23) and seed turned brown (Sept. 3) stages. The crop was grown with supplementary irrigation. All treatments were harvested on September 30, 2000. Excessive moisture conditions caused crop lodging and delayed maturity and harvest, resulting in an approximate 30 per cent seed loss. In general late flower bud removal had no impact on seed yield. A higher seeding rate resulted in a significant increase in seed yield. Both cultivars suffered from aster yellows disease, but the percentage of the incidence was relatively low compared to the 1999 cropping season. Essential oil content extraction and quality analysis are in progress at the Crop Development Centre, University of Saskatchewan.

Intercropping studies

A preliminary study was established to evaluate the interaction effects of several field crops (field peas, barley, silage corn) and spice crops (coriander, fenugreek and mustard) on their growth traits when grown as intercrops under field conditions. The main goal is to select crop combinations that have synergistic effect on plant growth so that those comparable crops can be used to develop efficient crop production systems in southern Alberta. Observations indicated the fenugreek and field peas grown as intercrops with silage corn at 50 per cent plant population appears to be compatible and highly productive than other crop combinations. Barley and mustard were highly competitive crops and suppressed the growth of less competitive intercrops such as fenugreek, fieldpeas and coriander.

Effect of physical property of the fruit on yield and composition of essential oil of coriander (*Coriandrum sativum* L.)

Coriander is one of the most extensively grown spice/essential oil crops in the Canadian Prairies. The essential oil content of dried fruit varies between 0.03 to 2.5 per cent and the fixed oil content varies between 9.9 to 27.7 per cent. The main component, linalool, is used as the quality parameter for coriander essential oil. One of the main factors influencing the essential oil yield and quality of coriander is physical property (mean fruit weight, split or crushed fruit per cent) of the fruit lot. This study examined the effect of physical property of coriander fruit on the recovery rate, composition and total yield of essential oil using unnamed coriander fruits obtained from the crops grown at six locations in southern Alberta. Treatments were whole, split and ground fruits. Approximately 150 g of cleaned fruit samples were used for each treatment and replicated twice. The essential oil extraction was performed using hydro-distillation method.

Results indicated that mean fruit weight, degree of fruit crushing and extraction time had a significant impact on total yield and quality of essential oil. On average, small fruit (9 to 11 g/1000 fruits) produced over a 1.6 fold increase in essential oil yield

compared to that of larger fruited treatments (15 to 17 g/1000 fruits). The essential oil extracted from whole fruit was superior in quality since the oil had significantly higher linalool content compared to other treatments. However, the ground fruit treatment consistently produced significantly higher oil yield than whole and split treatments and as a result the ground treatment produced the highest linalool yield among the treatment. Grinding of fruit prior to hydro-distillation enhanced the oil recovery rate and as a result reduced the oil extraction period by at least 1.5 hours. In summary, results of the present study indicate that grinding of fruit prior to hydro-distillation improves essential oil recovery rate, total essential oil yield and total linalool yields of both small-and large-fruited coriander, while splitting of fruit improves total oil yield, particularly in small-fruited coriander.

Crop selection and improvement

Seed of *Echinacea angustifolia*, *E. pallida*, *E. purpurea*, borage and stolons of peppermint, spearmint and Alaskan mint were treated with ester of Methyl Sulphonate (EMS; mutegenic compound). Treated seeds and stolons were planted in plugs or pots and placed in a greenhouse. In early spring, both *Echinacea* and mint species were transplanted in the field. *Echinacea* species will be evaluated for aster yellows disease resistance and medicinal quality. The mint species for over wintering ability and essential oil contents. Foliage of individual mint plants grown from the treated stolons was harvested and stored at -20°C prior to oil extraction. Oil extraction and composition analysis are in progress. Plants of both species were mulched with barley straw in mid October prior to freeze-up. Plant growth performance, essential oil yield and quality for mint, and medicinal qualities and aster yellows resistance for *Echinacea* will be determined in early spring. Seed harvested from the plants grown from EMS-treated seed will be field planted in the spring of 2001 for crop selection purpose. Crop selections of borage will be carried out based on seed shattering, crop maturity, and seed oil content and quality.

Evaluation and selection of different lines/selections of essential oil, spice and health promoting crops are conducted for adaptability under the growing conditions in southern Alberta and to develop management practices for improved and sustainable production. Plant species included in this evaluation are coriander, dill, rosemary, lavender and mint.

Technology Transfer Services

Program staff continued to answer numerous inquiries on the production of special crops, particularly on herb, spice and essential oil crops. Information on special crops was made available to producer newsletters and news media and the special crop variety performance fact sheet was updated. Program staff participated in courses, seminars and field tours. Demonstration plots of various special crops, including herbs, spices, essential oil, medicinal plants and other new crops at Brooks and Bow Island were visited by a large number of interested individuals and groups. Extension staff and other interested parties were provided with planting materials for demonstration and field testing to assist herb, essential oil and spice producers evaluate new crops and to develop agronomic practices.

The Special Crops Regional Variety Testing Program was coordinated, prepared and distributed. Performance data of registered varieties of fieldpeas, dry beans, lentils, fababeans and mustard was summarized and made available to cooperators, specialists, growers and agribusinesses.

The program staff cooperated with AVEC and supplied Echinacea for dehydration trials.

Special Crops Program (Beaverlodge)

R. El Hafid

Recognizing the lack of a special crops research initiative serving the Peace region, AAFRD proceeded with the recruitment of a research scientist in July 2000. The entire initiative is identified as the Crop Diversification Centre Peace (CDC Peace, located at the AAFC Beaverlodge Research Farm) to complement and collaborate with the special crops research programs at CDCN and CDCS. It is administered through the CDCN. This new initiative is indicative of the collaboration and partnership between Agriculture and Agri-Food Canada and Alberta Agriculture to ensure that the Peace region has a strong research framework to develop new technologies for the entire zone.

The mandate of this program is to promote crop diversification and new crop development, mainly in northern Alberta, with the ultimate objective of fostering economic viability and sustainability of the special crops industry in the Peace River Region.

El Hafid joined his position in July. It was, therefore, too late to conduct field experiments in spring. Since July, he participated in many conferences and meetings with researchers, producers, and other industry partners in and out of the province in order to get a better understanding of the challenges and opportunities facing agriculture in general and crop diversification in particular in the province. Based on the information gathered from these meetings, El Hafid elaborated a research program addressing some of those agricultural challenges.

Research Projects

Fall seeding studies

Field experiments were established in October 2000 at three different locations in the province (CDCN, CDCS and CDC Peace). The proposed project will examine the practicality and feasibility of fall seeding practice of several special crops (four spice crops and two pulse crops) and its impact on seed yield and quality under contrast production environments in Alberta.

Technology Transfer Services

The following activities summarize the technology transfer services provided by the program leader: received and answered numerous inquires regarding a wide range of new crops production; provided some producers with copies of written materials on many aspects related to the agronomics of special crops.

Interviewed by the CKUA radio on crop diversification opportunities in the Peace region, and potential agronomic research in this area; published an article on crop diversification in the "Peace Views" newsletter; joined the team working on developing a hemp CD; and wrote three sections on hemp botany and biology, hemp history, and hemp global status.

Attended many producers and scientific meetings in Alberta and also in other prairie provinces.